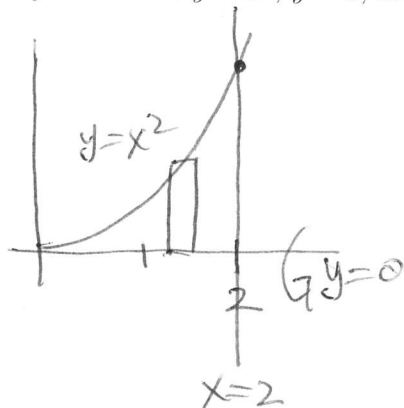Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (6 pts.) Find the volume of the solid of revolution obtained by rotating the region bounded by the curves $y = x^2$, $y = 0$, and $x = 2$ around the x–axis.
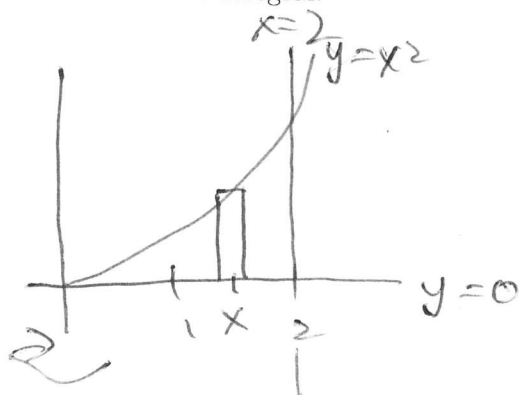
$$dV = \pi (x^2)^2 dx$$

$$V = \int_0^2 \pi x^4 dx = \pi \left(\frac{1}{5} x^5 \Big|_0^2 \right)$$

$$= \pi \left(\frac{32}{5} - 0 \right) = \frac{32\pi}{5} \; //$$

2. (4 pts.) Write down a definite integral that gives the volume of the solid obtained by revolving the region in problem 1 about the y-axis *using the shell method*. You do not have to evaluate the integral.
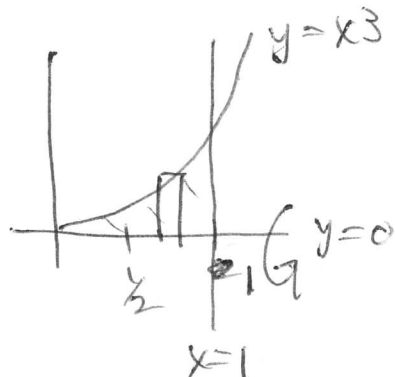
$$dV = 2\pi x (x^2) dx$$

$$V = \int_0^2 2\pi x^3 dx \; //$$

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.
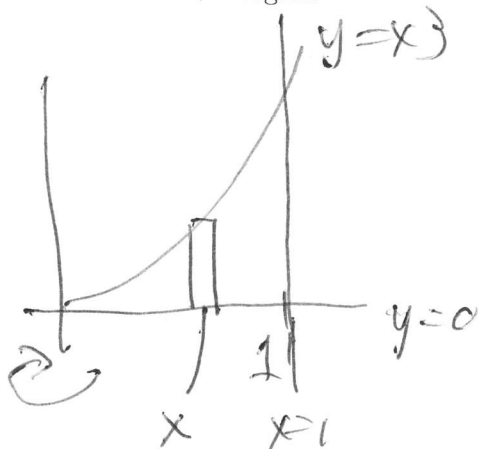
1. (6 pts.) Find the volume of the solid of revolution obtained by rotating the region bounded by the curves $y = x^3$, $y = 0$, and $x = 1$ around the x–axis.

$$dV = \pi (x^3)^2 dx$$

$$V = \int_0^1 \pi x^6 dx = \pi \left(\frac{1}{7} x^7 \Big|_0^1 \right)$$

$$= \frac{\pi}{7} \text{ //}$$

2. (4 pts.) Write down a definite integral that gives the volume of the solid obtained by revolving the region in problem 1 about the y-axis *using the shell method*. You do not have to evaluate the integral.
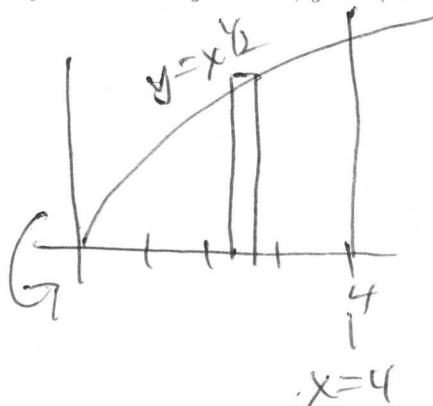
$$dV = 2\pi x (x^3) dx$$

$$V = \int_0^1 2\pi x^4 dx \text{ //}$$

Answer all of the following questions in the space provided. Show all work as partial credit may be given. Answers without justification, even if they are correct, will earn no credit.

1. (6 pts.) Find the volume of the solid of revolution obtained by rotating the region bounded by the curves $y = x^{1/2}$, $y = 0$, and $x = 4$ around the x–axis.

$$dV = \pi \left(x^{1/2}\right)^2 dx$$

$$V = \int_0^4 \pi x \, dx = \pi \left(\tfrac{1}{2}x^2 \Big|_0^4\right)$$

$$= 2\pi$$

2. (4 pts.) Write down a definite integral that gives the volume of the solid obtained by revolving the region in problem 1 about the y-axis *using the shell method*. You do not have to evaluate the integral.

$$dV = 2\pi (x)\left(x^{1/2}\right) dx$$

$$V = \int_0^4 2\pi x^{3/2} \, dx$$